CLAIMS

What is claimed is:

1. An electrical circuit, comprising:

a dissipative clamp circuit coupled to an input of the electrical circuit;

an inductive element coupled between the dissipative clamp circuit and an output of the electrical circuit; and

a switch coupled in series with the inductive element;

the dissipative clamp circuit coupled to provide a clamp voltage across the inductive element, the clamp voltage provided by the dissipative clamp circuit responsive to conditions at the input of the electrical circuit, the dissipative clamp circuit coupled to maintain a voltage across the switch below a switch voltage limit.

2. The electrical circuit of claim 1 wherein the dissipative clamp circuit is coupled to be responsive to conditions at the output of the electrical circuit.

3. The electrical circuit of claim 1 wherein the electrical circuit is a power conversion circuit.

4. The electrical circuit of claim 3 wherein the power conversion circuit is a forward converter power conversion circuit.

5. The electrical circuit of claim 1 wherein the inductive element comprises a winding of a transformer.

6. The electrical circuit of claim 1 wherein the switch comprises a first transistor.

7. The electrical circuit of claim 6 wherein the first transistor comprises a first bipolar transistor.

8. The electrical circuit of claim 6 wherein the first transistor comprises a first metal oxide semiconductor (MOS) transistor.

9. The electrical circuit of claim 1 wherein the dissipative clamp circuit comprises a second transistor coupled to the inductive element to dissipate energy stored in the inductive element.

10. The electrical circuit of claim 9 wherein the second transistor comprises a second bipolar transistor.

11. The electrical circuit of claim 9 wherein the second transistor comprises a second metal oxide semiconductor (MOS) transistor.

12. The electrical circuit of claim 1 wherein the input of the electrical circuit is coupled to receive an input voltage.

13. The electrical circuit of claim 12 wherein the dissipative circuit is coupled to be responsive to varying voltage conditions at the input of the electrical circuit.

14. The electrical circuit of claim 12 wherein the input of the electrical circuit is coupled to receive the input voltage from a rectifier coupled to rectify an alternating current (AC) line voltage.

15. The electrical circuit of claim 12 wherein the dissipative circuit is coupled to be responsive to a varying amount of energy being clamped across the inductive element of the electrical circuit.

16. The electrical circuit of claim 15 wherein the amount of energy being clamped across the inductive element varies in response to a varying peak current in the inductive element.

17. The electrical circuit of claim 16 wherein the output of the electrical circuit is coupled to a load, the varying peak current in the inductive element to vary in response to changes in the load coupled to the output of the electrical circuit.

18. The electrical circuit of claim 16 wherein the varying peak current in the inductive element is coupled to vary in response to a soft start period of a control of the switch.

19. The electrical circuit of claim 1 further comprising a second input coupled to the switch, wherein switching of the switch is responsive to the second input of the electrical circuit.

20. The electrical circuit of claim 19 wherein the clamp voltage provided by the dissipative clamp circuit is further responsive to conditions at the second input of the electrical circuit.

21. The electrical circuit of claim 1 further comprising a second output coupled to the inductive element, wherein the clamp voltage provided by the dissipative clamp circuit is further responsive to conditions at the second output of the electrical circuit.

22. A power supply, comprising:

an energy transfer element having an energy transfer element input and an energy transfer element output coupled to an output of the power supply;

a switching regulator circuit including a power switch coupled to the energy transfer element input, and a control circuit coupled to the power switch

and the output of the power supply, the control circuit coupled to switch the power switch to regulate the output of the power supply; and

a dissipative clamp circuit coupled to the energy transfer element input, the dissipative clamp circuit coupled to a power supply input to receive an input voltage, the dissipative clamp circuit including:

a sensing network coupled to the power supply input to sense the input voltage;

a dissipative element coupled to the sensing network and coupled to the energy transfer element;

an energy storage element coupled to the energy transfer element and the dissipative element; and

a first diode coupled between the power switch and the dissipative element and the energy storage element.

23. The power supply of claim 22 wherein the energy storage element comprises a capacitor coupled to the energy transfer element input and the first diode.

24. The power supply of claim 22 wherein the dissipative element comprises a first transistor coupled to the energy storage element, the first transistor coupled to dissipate energy in the energy storage element in response to a signal received from the sensing network.

25. The power supply of claim 22 wherein the sensing network comprises:

a voltage divider circuit coupled to the reference voltage circuit to provide a scaled voltage responsive to a reference voltage added to the input voltage; and

a second transistor coupled to the dissipative element and coupled to the voltage divider, the second transistor coupled to provide a current that is coupled to decrease linearly with increasing input voltage.

26. The power supply of claim 25 wherein the reference voltage is provided by a reference voltage circuit coupled to the power supply input, the reference voltage circuit including a zener diode coupled between the voltage divider circuit and the power supply input, the reference voltage circuit further including a second capacitor coupled between the voltage divider circuit and the power supply input.

27. A method, comprising:

switching a power supply input on an energy transfer element;

regulating a power supply output by switching the power supply input on the energy transfer element;

clamping a voltage on the energy transfer element to a clamp voltage; and

varying the clamp voltage in response to the power supply input.

28. The method of claim 27 wherein the varying of the clamp voltage is substantially independent of the power supply output.

29. The method of claim 28 wherein the varying of the clamp voltage is further substantially independent of leakage inductance of the energy transfer element.

30. The method of claim 27 wherein clamping the voltage on the energy transfer element comprises dissipating energy stored in leakage inductance of the energy transfer element in response to the power supply input.

31. The method of claim 30 wherein varying the clamp voltage comprises varying the clamp voltage substantially inversely linearly with respect to the power supply input.